Greetings from Kyoto-U

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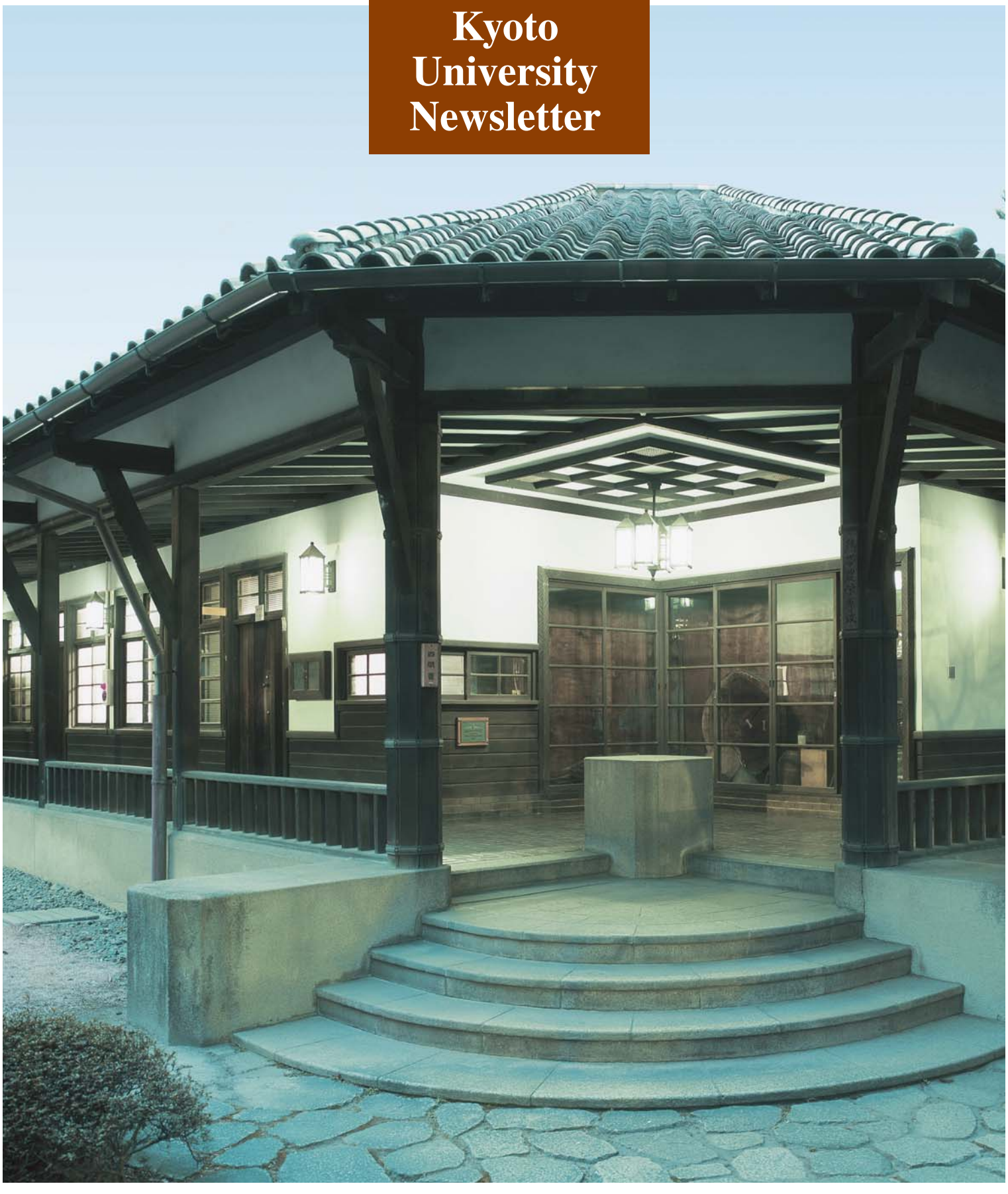
Issue 19

楽友 Raku-Yu

Kyoto University Newsletter



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Editor's Notes

In an information-oriented society, we can gather various types of information very easily. When researching something, we can find 80% to 90% of the necessary information on the Internet through skillful searching. The Internet is very convenient for learning the outline of things. Meanwhile, research and education based on research at universities take a lot of effort to clarify the remaining part which cannot easily be learned. I believe that such a clarification process nurtures shining originality and creativity.

The research and other activities of researchers introduced in articles from *Raku-Yu* are regarded as "masterpieces" and "excellent articles" in various genres, which can be regarded as proof of the high quality of Kyoto University. If many foreign researchers and international students learn from this research and these activities by feeling their profundity, it would be a great pleasure for me, as a member involved in editing *Raku-Yu*.

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A Note on Order of Names

As a general rule, names appearing in *Raku-Yu* are written in given name/family name order.

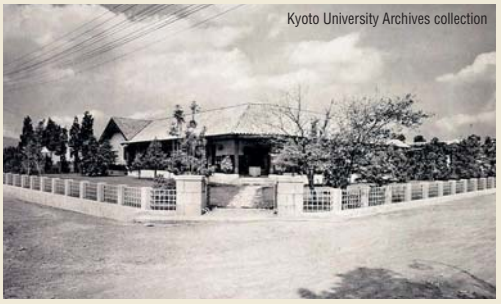
楽
Raku-Yu means to respect, treasure, and enjoy one's friendship.
友

This name was taken from the assembly hall called "*Raku-Yu Kaikan*" that commemorated the 25th anniversary of the founding of Kyoto University.

Cover Photo: Former Head Office of Forest Research Station

With economic development resulting from the First World War as a backdrop, the policy to expand institutions of higher education was developed in Japan from the late 1910s to the early 1920s. In Kyoto University, the Faculty of Economics and Faculty of Agriculture were established in 1919 and 1923, respectively. The establishment of the Faculty of Agriculture lies in population growth followed by economic development and an increase in the demand for agricultural produce.

With the addition of these faculties and an increase in the number of students, the present-day northern campus was obtained as its new site. Located in the northern campus were many facilities that required extensive green areas, such as the Experimental Farm, the University Forests and the Botanical Gardens of the Faculty of Science, Kyoto University. In particular, the size of the University Forests, some of which were located in Japan's former colonies, such as Taiwan, Korea and Sakhalin, were so large that the total area exceeded 100,000 ha. These forests, in which reforestation was implemented in addition to education and research, seem to have played an important role in the financial management of the university.


Kyoto University Archives collection

The office at the time of completion. With a spacious arrangement of buildings, the northern campus showed a landscape quite different from that of other campuses.

Kohei SHIOTA Born in 1946, Kohei Shiota completed his doctoral course at the Graduate School of Medicine and obtained a Ph.D. of Kyoto University in 1976. He accepted an opportunity to be a professor of anatomy and developmental biology in the Faculty of Medicine of Kyoto University in 1990. While in this position, he also worked as a visiting scientist of the University of Washington and a visiting professor of the Free University of Berlin. In 2007, he was installed as Dean of the Graduate School of Medicine and the Faculty of Medicine, Kyoto University. Since October 2008, he has held his present position of Executive Vice-President of Kyoto University.

In October 2010, Shiota was appointed as Executive Vice-President for General Affairs and Personnel. To secure the university's research and operational budgets amid the current severe financial situation in Japan, universities are required to clearly explain their research findings to society. Furthermore, in the current trend of rapidly advancing inter-university competition and cooperation, which has been advancing both globally and domestically, he has realized all too well the importance of publicity activities for widely promoting the university's attitude, characteristics and attraction to the world. "There is no denying that our university has not yet reached the same level as universities in western countries in terms of the ability to disseminate these kinds of information. I would like to put on my thinking cap and consider how we should develop our publicity activities, including through *Raku-yu* and our university website, in order to increase our attraction from a global perspective, and make concerted efforts to that end," said the Executive Vice-President, expressing his resolve.

Toward an international university at the heart of Japanese culture

Kyoto University (KU) is the second oldest and second largest national university in Japan. In its history of over 110 years, KU has produced prominent scientists in various research areas, including seven Nobel Prize laureates, and a number of graduates who have played leading roles both domestically and internationally. However, in addition to appreciating the past glories, we have to step forward to brave uncharted frontiers and make innovative achievements. To this end, internationalization is becoming increasingly vital. Research activities in every discipline have become globally borderless, and the exchange of researchers and students is flourishing. It is a mission of KU to "promote foreign academic exchange and thereby strive to contribute to the well-being of the world." Every year, more than 5,000 researchers from KU visit universities and research institutes in other countries, and over 3,000 foreign researchers come to visit KU. Some 1,400 foreign students are studying in KU. International symposia are frequently held on the campus. In this regard, KU may already be internationalized. However, Japanese universities, including KU, do not receive a sufficiently high reputation in the international community, as shown in world university rankings. This is partly because the proportion of foreign students is comparatively low and most educational courses are given in the Japanese language. In 2009, we launched a new international educational initiative called the KU Profile (Kyoto University Project for Future International Leaders), in which high quality education in twelve courses are given entirely in English, and students can obtain a degree in English (http://www.opir.kyoto-u.ac.jp/kuprofile/e/kuprofile/index.html). We intend to increase the number of courses taught in English, which should be beneficial not only for foreign students but also for Japanese students.

To promote the international exchange of researchers and students and to make KU better known to the world, international public relations and information dissemination are essential. Various activities and news on the campus are reported on the English, Chinese and Korean websites of KU. Educational programs and research activities are introduced on the web pages of each school, institute and laboratory. In addition to those information sources, we aim for this English newsletter *Raku-Yu* to provide a range of information on education, research and other activities ongoing in KU, and to help readers understand the unique activities of KU and the people working and studying there. We welcome comments, suggestions and critiques, which would help improve *Raku-Yu* and increase its appeal.

塩田浩平

Kohei SHIOTA
Executive Vice-President, Kyoto University

Vietnam National University, Hanoi – Kyoto University Collaboration Office (VKCO)

Establishing a collaboration office:

Under Global 30, a project launched in 2009 by the Ministry of Education, Culture, Sports, Science and Technology for establishing core universities for internationalization, bachelor and master's programs taught in English are strengthened in the 13 core universities. The program has also promoted the establishment by the core universities of eight overseas offices for shared utilization by universities, mainly in former socialist states with many outstanding students and young researchers. The eight overseas offices are in Russia, Tunisia, Uzbekistan, India (2), Vietnam, Egypt and Germany. These offices act as agencies for disseminating information and news releases on studying in Japan, for inviting exchange students, and for admissions screening for Japanese universities. The International Center of the Organization for the Promotion of International Relations at Kyoto University began preparing for the establishment of the Vietnam Office immediately after the Japan-Vietnam Principals' Conference, which was held in September 2009, and held the opening ceremony of the Vietnam National University, Hanoi – Kyoto University Collaboration Office (VKCO) on September 17, 2010. This is the fifth overseas office for shared utilization by universities established by the Global 30 Project.

Vietnam:

Vietnam has nearly the same land area and population as Japan. Also, its traditional ideologies, religions and written characters are Confucianism, Buddhism and *kanji*, the same as those of Japan. Hồ Chí Minh, the leader of the August Revolution in 1945, was born of one of the landowner and bureaucrat families that made up the middle class in those days under the French protectorate. During adolescence, he lived in Paris and campaigned for the independence of Vietnam in Shanghai, Guangzhou and Hong Kong. Hồ respected Sun Wen, valued the route of nationalism and the United Front, and positively understood the roles of landowners and capitalists, and was negative toward class conflict. Despite the fact that Hồ carried out romanization and the abolition of kanji after the revolution, he was well-known as an excellent poet of Chinese-style Kanji poems. Before the revolution, Hồ came into conflict with extreme left communists, and while studying in Russia, he was harshly criticized by his Russian name Lin in a journal of ideas by the extreme left communists. After the August Revolution, however, Hồ remained in

The building of International Studies Department, Vietnam National University, Hanoi (VKCO is located in this building.)


Ribbon cutting ceremony at the opening of VKCO

President Matsumoto offering greetings at the opening ceremony of Vietnam National University, Hanoi–Kyoto University Collaboration Office (VKCO)

Director Shin'e and Dr. Tsuy talking with members of Musashino University in the remote conference room

a symbolic position, like the Emperor of Japan. During wars against France and the U.S. and the Cold War, the Communist Party of Vietnam (then Vietnam Labor Party) took an extreme left stance, totally eschewed the market economy, and ruined the Vietnamese economy.

Studying abroad beyond political systems:

After setting the Doi Moi (reform) drive in motion in December 1986, the Vietnamese government and the Communist Party drastically changed their direction to promote Socialist policies under a market economy, which was the direction Hồ originally wanted to follow. At the same time, the government opened destination countries for studying abroad to those in the Western block, expanding beyond those previously limited to the Eastern block. In the early 20th century in Vietnam, in Hồ's boyhood, there was the "Dong Du Movement", a movement to study in Japan. Although Hồ did not participate in this movement, young Vietnamese in the middle class came to Japan in great numbers without any external support. (After coming to Japan, these Vietnamese were supported by progressive politicians and educators in Japan, such as Tsuyoshi Inukai.) Currently, in the early 21st century in Vietnam, with the middle class being reestablished, various modes of studying abroad appear in addition to the old state-supported style of studying abroad. Although the desired destination countries for studying are predominantly countries in the English-speaking world, such as the U.S., U.K., Canada and Australia, Japan is also chosen by many young Vietnamese people because of Japan's superior industrial technologies, content industry, including comics and animations, and the history of the Dong Du Movement, which they learned about in junior and senior high school.

Dr. Ngo Minh Thuy, the Vietnamese director of the Collaboration Office, and I, as the Japanese director of the Collaboration Office, would like to develop the Vietnam National University, Hanoi – Kyoto University Collaboration Office (VKCO) as a place to provide proper advice and a wealth of information for studying in Japan to these young Vietnamese.

Toshihiko SHIN'E
- Born in 1967
- Field of specialization: Ethno-history of South East Asia
- Ph.D., Graduate School of Frontier Sciences, the University of Tokyo
- Director, Vietnam National University Hanoi - Kyoto University Collaboration Office

I would like to convey detailed information on studying in Japan to outstanding students and young researchers in Vietnam.

Director Toshihiko Shin'e has loved reading since his childhood. According to him, the knowledge he gained through reading books in broad genres such as science, history and literature was useful after he graduated from university for the approximately 9 years when he worked at Vietnam National University Ho Chi Minh City, Hue University and Hue Monument Conservation Center as a Japanese teacher and a interpreter. He later went on to study at the Department of International Studies, Graduate School of Frontier Sciences at the University of Tokyo. To obtain historical data on non-literate peoples in Vietnam, he, as a historian, collected oral folklore in mountainous regions. During that process, he came to have doubts about slogans related to international cooperation, such as the civilization of primitive natives and the settlement of nomads.

"For example, a dam being constructed in Vietnam is labeled as an international cooperation project. But former inhabitants will be forced to move out due to the construction. I conducted research on former inhabitants' history and current situation, and the reduction of and countermeasures for their difficulties. Local people do not need development projects forced on them with a superior attitude. They must take measures themselves considering their own future," Director Shin'e emphasized.

Before long, he relocated his research and teaching bases to Kyoto University. While seeking to become permanently stationed in Vietnam, he was sounded out for the post of director of the Vietnam National University, Hanoi – Kyoto University Collaboration Office (VKCO), to be established by the center for international programs of Kyoto University and Vietnam National University. That was at the end of 2009.

While many Vietnamese students wish to study in English-speaking countries such as the U.S. and U.K., they have much interest in Japan, a country that has drawn attention for its industrial engineering and content industry. Director Shin'e expressed his ambition to operate the Collaboration Office as a center to convey the attractiveness of Japanese universities in general, not only of Kyoto University, using the experiences he accumulated as a Japanese language teacher. In addition, he believes that his mission as a researcher is to produce as many theses as possible based on the data he has collected.

Fostering future academic leaders, forging a new cultural climate unique to the *Hakubi* Project —The *Hakubi* Project evolving further in its third year—

In 2009, Kyoto University inaugurated the *Hakubi* Project with the aim of fostering visionary young researchers who will pioneer new paths in their respective academic fields. In 2010, the second year of the project, the university received 517 applications from around the world. Of those, 19 were selected in October. Since the number of applicants was 27.2 times that of the available positions, the competition was fierce. The successful applicants, having cleared this high hurdle, are expected to initiate their research activities during the coming academic year. Accordingly, there will be 37 *Hakubi* researchers affiliated with the Kyoto University Young Researcher Development Center, including those who have already begun their research activities.

Of the various features of the *Hakubi* Project, which were explained in the previous issue, the most outstanding are:

1) Ensuring stable positions within the university

Hakubi researchers are basically employed for five years either as an associate professor or an assistant professor. During their service terms, the university provides an annual salary (at least 4.8 million yen as of 2010) plus annual research fund amounting to 1 to 4 million yen, depending on the content of individual researchers' research plans. Moreover, the university has a campus-wide support system for *Hakubi* researchers; in particular, the Director and the Program Managers of the Young Researcher Development Center consistently support the researchers with their research programs throughout their service terms.

2) Offering a free and creative research environment

Irrespective of the actual locations of their research activities (laboratories or other facilities), all researchers are affiliated with the Young Researcher Development Center. This relieves *Hakubi* researchers of teaching or administrative obligations. To allow researchers to concentrate on their respective research activities based on long-term perspectives, the university imposes only minimum obligations: researchers are asked to furnish annual reports on their research activities and give presentations on their research results at the end of their fixed terms. The university does not evaluate their performance during their terms.

At *Hakubi* Café, organized at a meeting space in the Center, researchers can hold in-depth discussions. Moreover, regular presentation meetings will provide researchers from diverse academic fields with ideal opportunities to stimulate and inspire their creativity each other.

The presentation meetings—dubbed *Hakubi* Seminars—are basically held twice a month. Each time, one researcher presents on the process/results of his/her research activities. By giving a presentation to an audience specialized in a variety of academic fields, speakers have the opportunity to develop their presentation skills. Moreover, sharp and ingoing questions and comments from the perspectives of non-specialists often trigger in-depth discussions. Such discussions frequently enable presenters to obtain creative ideas and find innovative solutions.

At one such seminar, for instance, Dr. Kaori Shiojiri studying at the Center for Ecological Research reported on her experiments and observations of a plant and its pest. Her research was based on the following assumption: A plant suffering from pest damage learns about the pest and offers the relevant information to other plants of the same species growing in the neighborhood. During and after her presentation, participants in the seminar asked various questions regarding experiment methods and interpretations of observation data. Although the questions and comments were based on non-specialist viewpoints, several remarks were so enlightening that they left a deep impression on the presenter.

Young researchers, full of intellectual curiosity, often continue their heated discussions at parties held after the seminars. These debates afford researchers considerable stimulation, kindling their enthusiasm for academic

The scenes from the *Hakubi* Seminars

pursuit. Sometimes researchers bring their friends—academicians from other universities and corporate executives—to the seminars. These guests often help deepen discussions by presenting their perspectives.

The objective of the *Hakubi* Project is "to foster human resources with superb creativity, broad perspectives, and flexible mindsets, all essential for pioneering new academic frontiers." The heated discussions held at the *Hakubi* Seminars indicate that this objective is surely being fulfilled.

Attractive Features of the *Hakubi* Project and its Future Outlook —From the Perspectives of Non-Japanese *Hakubi* Researchers—

In the *Hakubi* Project, Kyoto University invites applications from excellent researchers from around the world. At present, four non-Japanese researchers are serving as *Hakubi* researchers. The editor of *Raku-yu* had an opportunity of interviewing two of them: Dr. Nathan Badenoch (Associate Professor) and Dr. Aaron Miller (Assistant Professor). They explained their impressions of the project and its attractive features.

Raku-yu: How did you learn about the *Hakubi* Project?

Nathan: In 2009, I was in Laos, engaged in an ODA program run by the Swedish government. Since I became interested in studies of local culture and language, I asked my Ph.D. adviser for advice. He was the professor at the Graduate School of Asian and African Area Studies of Kyoto University, where I once studied. He suggested that I apply for the *Hakubi* Project, which had just begun at that time.

Aaron: I learned about the project from my adviser at the University of Oxford. I think he heard about the project from the staff of Kyoto University's London Office.

Raku-yu: What impressions did you have when you heard about the project?

Nathan: I found the project to be very attractive since I learned that I could freely select my research theme. I thought that I would be able to dedicate myself to something original, as my own theme. I didn't expect to pass the screening, however, since I heard that the competition would be extremely severe.

Aaron: I did not expect to pass, either. As for me, I was most attracted by the fact that the project had a five-year service term. This is great, since the selected researchers can then prepare long-term research plans.

Nathan: During the screening process, I was interviewed by members of the *Hakuraku* Council, as well as by the President of Kyoto University. Their sharp questions made me a little nervous, but they also made me realize that joining the project would be a stimulating and interesting experience. Of course, I understood that it would not be easy to accomplish the research tasks, but I knew that it would be rewarding to join the program, that is, if I were admitted.

Aaron: Your remarks remind me of the heated discussion I had with the President during the interview. We discussed the future of humankind. It was really exciting.

Raku-yu: What do you think about having regular *Hakubi* Seminars?

Aaron: Personally I believe that it is truly rewarding to join the seminars. We have the chance to hold stimulating and interesting discussions since the seminars involve specialists from diverse academic fields.

Nathan: Since *Hakubi* researchers have professional knowledge and strong intellectual curiosity, their questions tend to be clear and to the point. I often find it difficult to follow presentations by specialists in fields other than my own. However, by listening to others' questions, I frequently find myself beginning to understand. This makes me feel that my knowledge is being broadened.

Aaron: Listening to questions and suggestions from non-specialists often helps me understand my research objectives more deeply. This is why I recommend joining the *Hakubi* Project to researchers who feel that they need a breakthrough of some sort in their research activities.

Raku-yu: Finally, what do you think the most attractive features of the project are? If you were asked to recommend the project to young researchers from various parts of the world, what would you say?

Aaron: First of all, the conditions of the project are extremely favorable. It is indeed rare anywhere in the world to be able to study whatever you like for five years.

Nathan: I am looking forward to working with the researchers, all from such different backgrounds and specialities, to create something unique to the *Hakubi* Project — perhaps a "*Hakubi* culture" or research and academic dialogue.

Dr. Aaron Miller

Dr. Nathan Badenoch

Studying gene function *in natura* – robust control of a flowering-time gene in natural conditions

How do plants know when the time has come to bloom? In nature, each plant species blooms at a particular time of the year, presumably by sensing specific signals of the seasons from the environment. This is even remarkable when we consider that their natural habitat is filled with noise.

Flowering is a fascinating phenomenon not only for our daily life but also for scientists as a target of research. Many scientists have contributed to unveiling the flowering-time control mechanisms of plants. They have identified over a hundred flowering-related genes, and the functions of these genes have been studied, especially through the use of a model species of plant molecular genetics, *Arabidopsis thaliana*. We are one of a number of research groups that study the flowering-time control of *Arabidopsis* and its wild relatives — not in the laboratory but out in nature.

In the natural environment, seasonal changes of temperature only occur as a long-term trend over a period of a month or so. Actual changes of temperature are more complex, involving day-and-night, day-by-day, and week-by-week fluctuations. These fluctuations within periods shorter than a few weeks do not necessarily correspond to the changes in seasons. For example, we often experience a much warmer week than the previous week in autumn, despite the fact that snow is likely to come soon. Therefore, to detect the season from the temperature, plants have to "remember" the long term trend of past temperatures. In our recent study, by analyzing the relationship between gene expression and past temperature in the natural environment, we revealed that one of the key genes for flowering-time control is regulated in response to temperature trends over the previous six weeks, but not over longer or shorter periods.

Figure 1: Flowers of *Arabidopsis halleri* subsp. *gemmifera*, a study species that is a close relative to *A. thaliana*.

We studied a plant of the mustard family, *Arabidopsis halleri* subsp. *gemmifera*, which is a small-sized perennial herb native to Japan. We focused on a gene that we named *AhgFLC*, a homolog (corresponding gene) of the *FLC* gene of *A. thaliana*. *FLC* encodes a flowering repressor, and its expressions are controlled in response to temperature. While the gene expression of *FLC* is up-regulated, the plants produce leaves and continue their vegetative growth. The expression of this gene has been known to be suppressed by prolonged cold weather and is considered to be the key mechanism whereby plants bloom after winter.

We established a field study site in a natural population of the study plant in Taka-Cho, Hyogo Pref., 80 km west of Kyoto (35°06' N, 134°55' E, altitude 190–230 m). The plant population inhabit an open site alongside a small stream that runs through secondary forest. Thousands of *A. halleri* plants continually grow in a habitat that extends for approx. 400 m along the stream. We visited this field site every week over a two-year period and we monitored the *AhgFLC* expression, plant phenology, and the temperatures.

The expression of *AhgFLC* showed a clear seasonal pattern, the highest being in the May – November period and the lowest in the January – February period. A gradual decrease and increase over a 9-11 week period occurred in the late autumn and in the early spring, respectively. These timings corresponded well to the timing of flower bud initiation and the end of flowering.

Further analyses using the mathematical models revealed that seasonal changes in expression levels of this gene were most well explained by the temperatures over the previous six weeks. It was surprising that 83% of the variation of the *AhgFLC* gene expression over the two-year period

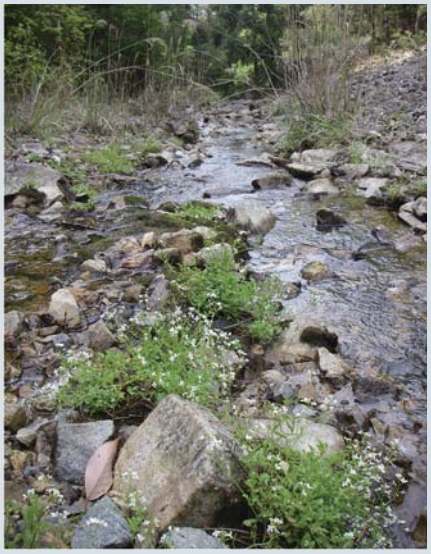


Figure 2: A natural population of *A. halleri* subsp. *gemmifera* at Taka-cho, Hyogo Prefecture. The two-year study was conducted in this field site.

could be explained solely by past temperatures. During the 96 census for two years, we collected leaves in various conditions even under drought, flooding and snow covered conditions. The control of this gene turned out to be robust enough to detect seasons from temperature signals amid noisy complex natural environments.

How do plants realize this 'six-week memory' of past temperatures? Whether plants continue their vegetative growth by producing leaves or switch to reproductive growth by producing flowers is determined by the developmental fate of the cells at the shoot apical meristem. It is expected that the cells in the apical meristem are replaced by new cells over six weeks. Therefore the "memory" should be transmitted through cell division to the daughter cells. It has been reported that epigenetic modifications of chromatin structure control the expression of *FLC*, and the mechanism can maintain the states of gene regulation through cell division. Presumably, a similar mechanism underlies the cellular memory of *AhgFLC*.

Our study demonstrated the importance of studying gene function in the natural conditions where natural selection has provided adaptation to the existent mechanisms of gene regulations. In such conditions, the "robustness" of regulation is critical for genes to function. As the importance of combining the contrasting *in vivo* and *in vitro* studies has been emphasized in biological researches, the time has come to integrate study *in natura*. *In natura* study would provide more comprehensive understanding of biological functions.

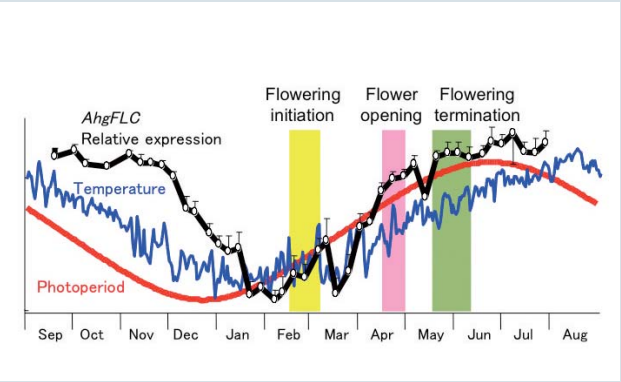


Figure 3: Seasonal change of the expression of *AhgFLC* gene (black line). Temperature and photoperiod changes are also shown (blue and red lines, respectively).

Hiroshi KUDOH
- Born in 1964
- Field of specialization: Plant Ecology
- Completed doctoral program, Graduate School of Science, Kyoto University
- Ph.D., Kyoto University
- Professor, Center for Ecological Research, Kyoto University
- URL http://www.ecology.kyoto-u.ac.jp/~kudoh

I personally have no particular preferences among flowers, so long as they are wild, free, and spontaneous.

Professor Hiroshi Kudoh's childhood dream was to become a zoologist or to be involved in the protection of wild animals, influenced by his favorite documentary programs about wildlife and animals. His interest in living creatures got him started his academic career with ecology. In university, he was fascinated by plant evolution and genetics. During his graduate course, he traveled around Japan to collect various wild plants and performed comparative studies on the genetic differences in the properties of those plants. Even after his postdoctoral research in the Smithsonian Environmental Research Center in the U.S. for two years, he accumulated his field research results.

Meanwhile, with the remarkable advances of molecular biology since the 1980s, various methods and technologies to analyze DNA have been newly developed, thus allowing a great number of genes to be analyzed within a short period of time. This has made the genetic analysis of outdoor plants possible not only in laboratories with a well-controlled environment but also in outdoor conditions under which plants are greatly affected by individual differences and the environment. It was Professor Kudoh who is one of the pioneering researchers in this outdoor genetic analysis of plants. He analyzed as many as 600 cruciferous plant gene samples collected in his two-year field work, and clarified what kind of directions and restrictions are given by the plant gene expression mechanism to the acclimatization to a complicated natural environment. "I like trying to do something which nobody has done before, with freewheeling thinking. Simple motives, such as "This seems interesting" and "I want to clarify unknown things," often stimulate my research."

He used to be a hard-core sports-oriented student in his school days, joining his junior high school football club and high school alpine club. "Unlike what I used to be, it is not easy for me to reach the summit these days because I become strongly attracted by plants around me soon after climbing up a mountain," Professor Kudoh said with a smile. Wild plants in nature fascinate him.

East Asia seen from the perspective of economic history

Today, East Asia, where Japan and China play a pivotal role, is one of the world's major industrial centers, with its trends being the object of much interest. However, in my school days, the social atmosphere was inclined towards the idea that clarifying the reason for Asia having fallen behind was the task of the social science. The situation started to completely change from the 1980s after East Asian countries began to be called "NICs (Newly Industrializing Countries)" and China further moved towards its Reform and Open-door Policy.

Arrival of the "Age of Asia"

The big changes in Asian society suddenly appeared as changes close to ordinary people. As for regular clothing, products made in Japan were replaced with products made in South Korea and Taiwan. The clothing sections of supermarkets became filled with inexpensive clothing and sundry goods. This trend shocked many researchers, who had assumed that South Korea and Taiwan were poor agricultural countries.

Studying Modern Korean Economic History, I believed that Japan's colonial rule featured barbarous and harsh aspects, and that would be the very cause of South Korea and Taiwan still remaining in an underdeveloped condition. However, the present South Korea has achieved the amazing development. What on earth happened to that country?

My interests and research method

In the mid-1980s, an epoch-making research trend called the "Intra-Asian Trade Theory" was developed. The theory was based on the grand idea that the very foundation of Asia's development was a condition under which a developed economic world had already been established in Asia before the advancement of Western countries in the 19th century.

The research method I finally devised after much trial and error in an attempt to conduct historical research on Asia's economic development was an analysis of long-term economic statistics. In state- and ethnic group-related issues involving several countries, the historical views of each respective country run counter to each other in many cases. So, to understand the situation as objectively as possible, I made an effort to collect as much quantitative data as I could. The best example is trade statistics. While trade statistics have great potential as a source of information, they have only been partly used due to the vast amount of data available.

Spread of capitalism and long-term development in Asia

However, this research provides me with new knowledge. Above all, the most important fact is the sustainable economic development in East Asia. Figure 1 shows the three modern periods in the past 100 years regarding the world's and each country's trade growth rates. According to this, the East Asian region, comprising Japan, Korea and Taiwan, as well as prewar Manchuria, constantly shows a high growth rate at more than double the world average. These are the only cases where high growth rates continued for such a long period of time.

Japan adopted capitalism through the Industrial Revolution towards the end of the 19th century, and at the same time, began establishing colonies to gradually grow into an empire. Japan met its rapidly growing demand for food with food imported from its colonies, and in the 1930s, also procured many intermediate raw materials from these colonies. And thus Japan could achieve a position on a par with Western powers as a newly industrialized country capable of exporting light industrial products to the global market.

Meanwhile, in Taiwan, Korea and Manchuria, capitalism developed quickly with the introduction of modern laws and social systems and implementation of large-scale infrastructure investment. All these elements were realized through the integration into the Empire of Japan. The economic social of capitalism they adopted, which had been developed on the mainland of Japan, was expanded to Taiwan, Korea and Manchuria under Japan's colonial rule. These processes jointly played the principal role in prewar East Asia in achieving the above-men-

	1870-1913	1913-1938	1955-1972
Average of world	3.1	0.9	9.8
Japan	7.8	4.8	18.0
Korea	8.6	12.4	32.5
Taiwan	9.9	6.6	22.1
Manchuria	7.4	4.2	6.2
China	2.2	-1.7	
India	2.5	-1.2	4.1
4 Countries of SE Asia	4.6	2.6	5.6
19 Countries of Latin America	3.7	1.1	5.1
U.K.	2.1	-0.7	7.2
U.S.A.	4.5	0.9	7.5
Germany, West Germany	4.0	-0.5	13.6

Figure 1: The rate of trade growth of each country and region

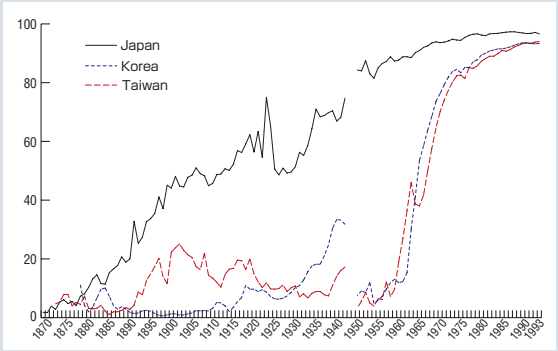


Figure 2: The percentage of industrial products in exportation of Japan, Korea and Taiwan

tioned high trade growth rates.

Then, what became of these relationships unique to East Asia after the dissolution of the Empire of Japan in the post-war period? As indicated in Figure 2, compared to Japan, Korea and Taiwan changed drastically into genuine exporting countries of industrial products in a very short period of time. In my understanding, this remarkable industrial development was achieved by Koreans and Taiwanese by independently connecting their historical circumstances continued from the pre-war period to establish a new international situation.

Toward the new theory of the East Asian economy

The features of East Asia's economic development are quite different from those of the Western world in terms of the strength of farmers' management as well as industrial development on the basis of various elements of their agricultural societies. In prewar East Asia, the agricultural sector made a significant contribution to the process of rapid capital accumulation by offering both agricultural goods and a labor force to the industrial sector, by providing markets for industrial products, and by serving as a financial source for industrial capital. After World War II, the industrial sector accelerated its growth, which also meant a process of directly causing erosion of the agricultural sector. East Asia fell into serious economic stagnation, with national-dependency on agriculture having disappeared, lowering competitiveness in the manufacturing industry with its increasingly higher wage rates, and a rapidly advancing aging society due to a decline in the birthrate. In other words, Japan, Korea and Taiwan are suffering from the same social problems.

The society of the coastal area in China, which still continues its explosive economic development, is considered to be advancing along the same course as Japan and Korea in a more condensed fashion. However, with the existence of a vast rural region and society behind the coastal area in China, it will take a long time for potential problems in this area to be revealed. If these problems are manifested, the degree of seriousness would be greater. This may be another serious problem for China's economy, in addition to environmental and resource-related problems, which are currently attracting much attention.

We have no other choice but to find clues to solve the problems we are currently facing in the histories where these problems originally arose. I believe that the way to tackle the problems with the theory of East Asian economy is to explore deeper and wider the process of Japan, Taiwan and Korean getting to this date, rather than praising their success stories and following up on the rapid changes in front of us.

Kazuo HORI

- Born in 1951
- Field of specialization: Economic History in East Asia
- Completed doctoral program, Graduate School of Letters, Kyoto University
- Ph.D., Kyoto University
- Professor, Graduate School of Economics, Kyoto University

Even when the direction of my research changes as I come to have broader interests, I can feel the same joy in searching for new knowledge.

Professor Kazuo Hori has two elder brothers, who grew up to be researchers in Oriental history and ecology, respectively. It was a very natural thing for Kazuo Hori, who became familiar with the academic books of his two brothers from his childhood, to have the aspiration to become a researcher. During his high school days, admiring his brothers, he committed himself to studying Oriental history, the same choice as his eldest brother, after wavering between science and humanities courses for his choice of study. "Even so, when my other brother talked about the most advanced ecological study, I thought it sounded interesting. As I am a man with a multiple-track mind, my interests are directed toward various things," Professor Hori said impishly.

His words are true to the path he has followed. When in the Faculty of Letters in his university, although he had started his academic life reading and interpreting Chinese classical literature, he developed a desire to face more practical issues and shifted his interest to the Korean minority problem in Japan and Japan's past colonial rule in the Korean Peninsula. After continuing his research on Korean history for one year at Seoul National University, he began his work at the Faculty of Economics, Kyoto University in 1989. The timing was when the "arrival of the age of Asia" started to be talked about following Asia's development in the mid-80s, and his object of study, affected by the spirit of the age, was directed toward Japanese and Korean economies, and later toward Taiwan and China. When all of Asia was in an upward spiral of economic development along with the tide of globalization, it was inevitable for Prof. Hori to expand his view to the entire East Asian area.

The professor said, "Regardless of what I study, I can feel the same joy in searching for new knowledge." He continued, "I would like to clarify the process of economic development unique to Asia, a process different from that of Western countries which have so far played a pivotal role in the economic history of the world. I wish to become one of the brushes that are used to paint a new history." Untying a scroll of the past, Prof. Hori is trying to show the future of Asia in 10 years and even in a hundred years.

Asli M. COLPAN
- Born in 1977
- Field of specialization: Corporate strategy and international business
- Completed M.Sc. degree at the University of Leeds
- Ph.D., Kyoto Institute of Technology
- Associate Professor, Graduate School of Management, Kyoto University

Conducting Management Research at Kyoto University?

Kyoto University has given me the opportunity to switch my career from engineering to management. I was lucky to be in the right place at the right time.

Dr. Colpan's first trip to Japan goes back to 1998 when she came to Wakayama to work as an intern at Shima Seiki, a world-renowned Japanese flat-knitting machinery manufacturer. She was fascinated by the highly motivated workforce and their whole-hearted devotion to the company as well as the unique technology that Masahiro Shima, the founder of the business, had developed. Given the first-hand knowledge at Shima Seiki, she thought she did not have much to learn on the technological aspects of flat knitting technology in England. As such, she began to take social science courses during her master's education, and ultimately decided to apply to Japan's Ministry of Education to further her study in Japan. The Ministry granted a scholarship that entitled her to pursue her doctoral degree. It was in engineering, not in management or economics, however.

She thus had to take the plunge into the world of management and economics by herself. Luckily for her, Kyoto University's Graduate School of Economics gave that opportunity. There her vision enlarged, as she became fascinated with many of the lectures in management as well as economics. She felt that the intellectual world of the social sciences was totally different from that of the natural sciences, and that they were directly connected to daily life and societal problems.

At present (after 10 years of academic work in Japan), Dr. Colpan is working on diversified "business groups" around the world. She studied textbooks that preached her that companies specializing in certain fields exhibit competitive advantages. However, being from Turkey, she has been surrounded by such business groups. Learning about Japanese *zaibatsu* and *kigyo shudan*, she recognized the importance of this unique business organization. Although she became fascinated by the subject, there was no systematic large-scale study on these groups. She thus aspires to make an important intellectual contribution to the management and economics literature through a new perspective that will force the textbooks to revise their chapter on the pros and cons of specialized vs. diversified companies.

The idea of Kyoto University having a management school can be puzzling to many people. After all, this university has been renowned for its philosophical and theoretical intellectual contributions since its establishment in 1897. Nevertheless, Kyoto University has long been widely known for its innovative and adaptive capabilities. And, I believe, the latest product of this trend is the establishment of the 'Graduate School of Management' in 2006, when the university responded to the societal needs of our time. The Management School has even established an all-English program as one of its core educational courses under the Global 30 initiative of the Ministry of Education.

The Graduate School of Management at Kyoto University is a professional business school that develops corporate executives, which is different from the many other departments and institutes at Kyoto University that nurture academic researchers. But this is only half of the story. The Graduate School of Management is also a research-oriented institution with colleagues conducting frontier research in different fields of business and management. The school has recently established the "Center for Research in Business Administration," which, I believe, will effectively direct the research orientation of the entire school in coming years. In the end, strong business schools contribute to society by not only cultivating good leaders and managers, but also producing state-of-the-art research outcomes in management scholarship.

Many people, especially those from the natural sciences, often ask how management research contributes to the well-being and advancement of society. While this question comes as unexpected and surprising to me, my research on "business groups" will change the minds of even the most skeptical, I hope.

While international scholarly interest on business groups has only intensified since the late 1990s, this particular business form has been a well-known phenomenon in Japan by the name *zaibatsu* in the pre-World War II period. Besides Mitsui and Sumitomo, the most famous Japanese *zaibatsu* was the Mitsubishi group established in the middle part of the 19th century by the Iwasaki family, with operations in ocean shipping, insurance, finance, mining, chemicals, machinery, food, real estate, and other industries. Led by Japan's developmental success, business groups then became integral and critical agents in many countries that have achieved a critical path of "modern economic growth" in the twentieth century, especially after the Second World War: South Korea, Taiwan, Brazil, India, Turkey – you name it.

Business groups, however, have not enjoyed an honorable reputation in social science research as they are often seen as the second-best economic institutions in the absence of well-functioning markets. Despite their early contributions to industrialization, their prolonged resilience is often argued to be harmful to economic wellbeing. Because of the diversity of their product spheres, conventional research has suggested that business groups can not effectively face the advancement of sophisticated technology and complicated know-how. Critics have argued that powerful families at the helm of business groups exercise their influence for their private gains, not for the welfare of the entire society.

When a national economy is built around business groups as a core institution, academic research on their business functions and economic outcomes undoubtedly has critical policy implications. For instance, shall those groups really be dismantled after their developmental role is concluded, or can they actually continue to have an effective standing under certain conditions? What are those conditions? Answering these questions is exactly what I aim for in my research. By thorough theoretical examination and rock-solid empirical fact-finding regarding the resilience of this organizational form, I am trying to pin down the exact conditions under which business groups can make positive contributions to the economy and society.

If the entrepreneurship of respective persons can be brought together, amazing things can be done. In the future, I would like to be involved in designing mechanisms to accomplish this, and putting these mechanisms into practical use.

Ryoichi KUSAMA
- Born in 1985
- Currently graduate student at the Graduate School of Engineering, Kyoto University

Ryoichi Kusama, who is enrolled in the Graduate School of Engineering, Kyoto University, participated in the St. Gallen Symposium held in May 2010 in St. Gallen in Switzerland. The symposium, which celebrated its 40th anniversary, is known as the "students' version of the Davos Conference", and has attended by nearly 600 students, professors and entrepreneurs from around the world each year for lively discussions. The theme of the previous symposium was "Entrepreneurs – Agents of Change." Below, Mr. Kusama explained his motives for participating in this international event, and what he learned from the event.

When did you learn about this symposium?

I had done an internship in Klagenfurt in southern Austria for one year from April 2008. Professor Yoko Ishikura of Hitotsubashi University was invited to that year's symposium, and I read her report about the symposium that she had posted on her blog. Her report impressed me as it was very interesting and exciting so that I decided to apply for the symposium next year after returning to Japan.

What was required for the screening?

You only had to submit an essay of about 5 pages of A4-size paper.

What did you write about in your essay?

Nowadays, people believe that a person who is called a leader is limited to the elite and those who have a strong will, but actually, that's not true. Every entrepreneurship, no matter how small it might be, has the intention to improve the society, but they just have little chance to demonstrate it. If we can create opportunities for them and establish mechanisms to assist everyone's small entrepreneurships, society could be a hundred or a thousand times better.

Around when did you start having such a desire?

The impact of an idea called "autonomous decentralization," which I learned about during my research activities, may have been important. This is an idea about a social structure, in which every individual thinks by himself/herself. The group characteristics are created in the process of developing interactions between individuals.

Can you describe the content of the symposium?

The symposium was composed of plenary sessions, participated by hundreds of people; small work sessions, each held on a respective theme, and a social gathering.

Which theme did you choose for your work session?

About social entrepreneurs and experience of those who had started their business at a young age. At the work session, lively discussion was held about the best environment for fostering entrepreneurship and necessary elements for being successful entrepreneur.

What left lasting impressions from the symposium?

One is that, with the words of Deng Xiaoping frequently being quoted, the presence of Chinese participants stood out. On an individual level, non-Japanese students were actively speaking out.

Did you feel that Japanese participants didn't have a strong presence compared to Chinese?

In former times in the world, Japan showed a strong presence compared to China. So now it may be time for China to show its strong presence, which may be an historical inevitability, right? Japanese people are often negatively described as lacking a hungry spirit compared to Chinese people. But actually, I think it means that Japanese people can think about things from a wider perspective, without having to be bound by ideology, like "For our family, for our region and for our country."

However, Japanese students are often said to lack aggressiveness.

That's true; it is a fact that Japanese students don't easily act, even when they want to do something. Because of the Japanese culture reflected in the saying, "The nail that sticks up gets hammered down" and the social pressure for job hunting, which starts from the third year of university. But if everyone would be more active, even at an insignificant level, we would be able to change the environment gradually. I have a number of friends who in fact have moved into action.

Is there anything you have taken action for?

I've launched a project where various people get together to find solutions to issues through brainstorming. This project is designed to improve each participant's thinking power and ability for discussion, and contribute to establishing networks with people from a wide range of fields. I'm planning to develop this project into a large mechanism that the outcome could contribute to our society in the future.

At the pre-conference. Mr. Kusama is the third person from the right.

A work session

APRU Research Symposium on the Interface between Molecular Biology and Nano-Biology

November 24–26, 2010

The Association of Pacific Rim Universities (APRU) is an academic consortium comprising forty-two universities from sixteen countries and regions throughout the Pacific Rim, including Kyoto University. APRU provides its member institutions with a platform for academic cooperation in areas such as economic development, urbanization and technology transfer, and a means to address issues such as climate change and ecosystem problems. Research symposia and academic conferences are among the core activities of APRU, and on November 24–26, 2010, Kyoto University hosted the association's first Research Symposium on the Interface between Molecular Biology and Nano-Biology in cooperation with the university's Graduate School of Biostudies and Institute for Integrated Cell-Material Sciences (iCeMS).

The symposium aimed to promote collaboration across the fields of molecular biology and nano-biology, in view of the increasing importance of life sciences. 178 researchers and students from institutions in nine different countries attended the event, giving presentations and exchanging ideas and information.

Kyoto University President, Dr. Hiroshi Matsumoto delivered a welcoming address to the assembled scholars at the beginning of the symposium's first day. The president's address was followed by a plenary lecture by Professor Masahiro Shirakawa of Kyoto University's Graduate School of Engineering. The three days of the symposium were divided into six sessions, each focusing on a different theme within the fields of molecular biology and nano-biology. The symposium participants, including many leading scholars in those fields, actively engaged in the discussions and dialogues.

The second day featured an academic poster session, the scheduled ninety minutes of which seemed all too short for the participants as they clustered around the various exhibits to exchange opinions and ideas. Many Kyoto University students were among the poster presenters, and the students made the most of this valuable opportunity to share their research findings with peers from overseas and discuss their work in English.

Commemorative photo

The poster session

Reception for International Visiting Academics

December 9, 2010

The welcome reception for international visiting academics has been held annually by Kyoto University since 2000. Through this event, KU aims to welcome scholars from around the world who have come to the university to undertake study and research, and also provide an opportunity for building friendships and connections between the international researchers and the university's faculty and staff. This year, the reception was attended by approximately 300 participants from over thirty university departments. In addition to the visiting scholars and KU faculty

members, the participants included President Hiroshi Matsumoto and several members of the university's executive staff.

The reception began with a greeting by Vice-President Junichi Mori, director-general of KU's Organization for the Promotion of International Relations, who served as MC for the duration of the event. Vice-President Mori's greeting was followed by a friendly welcome speech by President Matsumoto, in which the President discussed the international relations and research activities of KU in 2010 and described some places of interest in Kyoto. A toast was then delivered by Executive Vice-President Yuzo Ohnishi.

After the formalities, the international scholars and KU faculty members were able to mingle, make new acquaintances and partake of the buffet, which included halal and vegetarian dishes. The reception provided an excellent opportunity for the participants to meet and network with colleagues in diverse fields. As many of scholars' families also attended, it was also a good chance for the spouses and children of the researchers and staff to get to know each other and form lasting friendships.

Welcome speech by President Hiroshi Matsumoto

Partnership between Kyoto University and KCJS/SCTI

In 2005, the International Center of Kyoto University concluded general memoranda for academic cooperation and exchange with both the Kyoto Consortium for Japanese Studies (KCJS) and the Stanford Center for Technology and Innovation (SCTI). The KCJS is a consortium of fourteen universities in the U.S. which provides a one- or two-semester study abroad program of advanced Japanese language and cultural studies for undergraduates, and the SCTI offers a Japanese studies program for Stanford University students.

This partnership enables selected KU students to audit certain of the programs' courses. In the 2010 fall semester, six KU students participated in KCJS courses. Lectures included *Japanese Religion, Outside the Mainstream, the History and Culture of Japan, Kyoto: the Past in the Present, Families and Work in Post-war Japan,* and *the History of Architectural Space*. This provides an excellent opportunity for the students to experience academically challenging lectures delivered in English by prominent professors, and to learn about Japanese culture and society from new perspectives. It is also a good chance for the students to improve their English communication skills and build lasting friendships with students from the U.S.

Introduction of auditing students

The Language Exchange Partner (LEP) program is also run in collaboration between KU and the KCJS office. LEP pairs KU students up with KCJS students for language and cultural exchange. Approximately forty KU students participated in the program this fall. In September, three of the participating KU students organized a welcome party for newly arrived KCJS students which was attended by approximately eighty students from the U.S. and Japan.

The successful partnership between Kyoto University and the KCJS/SCTI has provided students from both sides with a valuable opportunity to enjoy intercultural communication and exchange, both inside and outside the classroom.

Further details on the KCJS and SCTI are available on the KU website:
http://www.kyoto-u.ac.jp/ja/education/international/program/kcjs.htm
http://www.kyoto-u.ac.jp/ja/education/international/program/scti.htm

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醍醐寺

Daigoji Temple — A world heritage temple immersed in beautiful cherry blossoms in spring

Daigoji Temple, 5 kilometers north of Kyoto University's Uji Campus, is one of several temples in Kyoto designated as a world heritage site. The extensive 660 ha precincts of the temple, founded in 874, are divided into two areas: Kami-Daigo and Shimo-Daigo, which are connected by a steep mountain trail, reminding visitors that this temple used to be a place for ascetic practice. While Kami-Daigo is ruled by silence, Shimo-Daigo impresses visitors with magnificent imagery. What attracts visitors' attention most among the structures in Shimo-Daigo is the five-story pagoda (national treasure). Completed in 951, this pagoda is the oldest wooden structure in Kyoto Prefecture. On the 29th of each month, the Door-opening Service of the five-story pagoda is held, along with a flea market called "Daigo Market" in front of the gate. In the *Reihokan* (museum), many precious cultural assets, such as Buddhist statues and paintings, are kept and exhibited. In spring and autumn, a special exhibition is also held.

Another feature of Daigoji Temple is cherry blossoms in the Shimo-Daigo area. Daigoji Temple's cherry blossoms begin to bloom in mid-March. With different types of cherry blossoms blooming one after another, for about three weeks the entire temple becomes a cherry blossom garden. In the spring of 1598, Hideyoshi Toyotomi, one of Japan's three unifiers, held a banquet in this garden in appreciation of his retainers and *nyouboushu* (women who wait on the lord), including his wife and concubines, who had supported him. This event was well-known by the name of "*Daigo-no-hanami*," (flower viewing at Daigo). Today, on the second Sunday of every April, Hideyoshi Toyotomi's cherry blossom-viewing parade is reproduced, modeled after this ancient event. On the stage in the precincts, *gagaku* (ancient court music) and *kyogen* (short farcical drama during a *noh* cycle) are performed. During this season, many tourists visit Daigoji Temple, filling the precincts with oohs and aahs while viewing the cherry blossoms.

In an event called *Hanami Gyoretsu* (cherry blossom-viewing parade), with a person playing the role of Hideyoshi Toyotomi at the head, a parade of people wearing costumes as in ancient days is reproduced.

Five-story pagoda, beautiful against the cherry blossoms. This pagoda is the oldest wooden structure in Kyoto Prefecture.

Garden of *Reihokan* that accommodates the treasures of Daigoji Temple.

Kondo Hall, the main hall of Daigoji Temple, is designated as a national treasure.